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COMPLETE SPECIFICATION

*This drawing is a reproduction of
the Original on a reduced scale*

Fig. 1

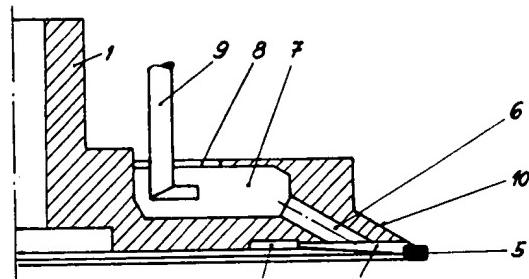


Fig. 2

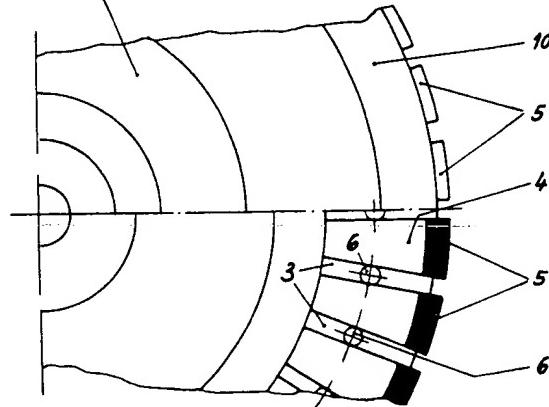


Fig. 3

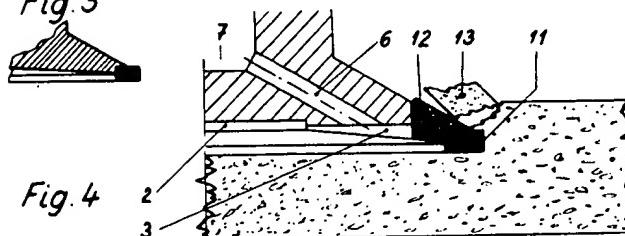


Fig. 4

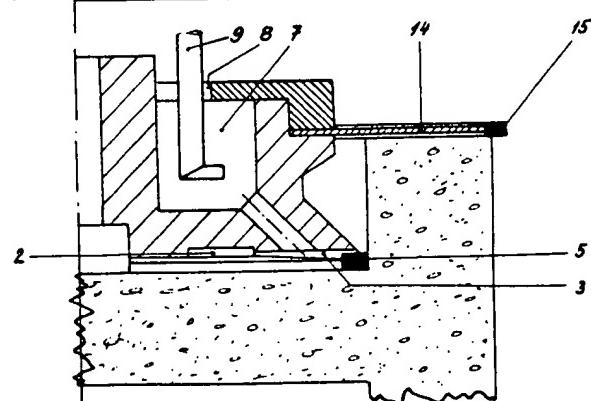


Fig. 5

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PATENT SPECIFICATION

(11) 1 215 064

DRAWINGS ATTACHED

- 1 215 064 (21) Application No. 11740/68 (22) Filed 11 March 1968
(31) Convention Application No. B94277 Ib/67c (32) Filed
2 Sept. 1967 in
(33) Germany (DT)
(45) Complete Specification published 9 Dec. 1970
(51) International Classification B 24 d 7/06
(52) Index at acceptance
B3D 2G3F1 2G3F3



GREAT BRITAIN
GROUP 326
CLASS 51
RECORDED

(54) IMPROVEMENTS RELATING TO STONE CUTTING AND FINISHING WHEELS

(71) We, ELISABETH SCHOLZ and HERMAN SCHOLZ, both German citizens trading as BAYERISCHE MASCHINENFABRIK F. J. SCHLAGETER, of 84 Regensburg, Prufeniger Schloss-strasse 7, Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and

10 by the following statement:—

The invention relates to a cutting and finishing wheel for stone or artificial-stone workpieces for use in surface-working machines.

15 Such wheels for surface-working machines are normally of carborundum, and the work-piece, consisting for example, of a step of a staircase, a flagstone or a windowsill, is ground away to the necessary extent in a large number of reciprocating cuts or passes, all the material having to be removed by cutting. The repeated grinding of the work-piece to and fro takes a considerable time, and because of the cutting away of all the material to be removed, makes a very high consumption of abrasive necessary.

20 For faster working the wheel may be fitted with diamond segments, but these segments have only a short life and are therefore very costly.

25 According to the present invention a cutting and finishing wheel is divided at its periphery into segments which are separated by cooling-water channels supplied by internal passages and each of which is provided with a radially projecting diamond segment. The provision of the cooling-water channels enables cooling-water to flow directly to the point of cutting so as to obtain effective cooling at the point where it is required and the combination of this with the diamond segments enables the cutting operation to be carried out in a single pass, thus considerably facilitating overall

30 40 45 operation.
45 The wheel is preferably provided with an annular chamber for cooling water which is located inwardly from the diamond seg-

ments and which is connected to the cooling water channels. This chamber has an inlet for water, thus enabling a continuous flow of water to be supplied to the channels. Since the chamber is located in the interior of the wheel the water in the chamber is thrown outwardly by centrifugal force to provide a continuous supply of cooling water under pressure.

50 55 Construction in accordance with the invention will now be described by way of example with reference to the accompanying drawings in which:

55 60 Figure 1 is an axial section through one half of a cutting and finishing wheel;

60 65 Figure 2 shows the wheel in upper and lower plan views;

65 Figure 3 is an axial section through the outer part of the wheel;

70 Figure 4 is an axial section of the outer part of a modified wheel; and

70 75 Figure 5 is an axial section of a modified construction of wheel.

75 80 Turning first to Figures 1 and 2, the wheel 1 is mounted on a driving shaft (not shown). The outer edge of the wheel tapers outward conically and is provided on the underside with radially extending milled channels 3, adjoining an annular duct 2. The segments 4 formed on the wheel by the radial milled channels 3 are provided at their outer periphery with diamond segments 5 projecting radially outwards. These diamond segments are so secured to the wheel segments, for example, by electric soldering, that they project a little beyond the outer periphery of the wheel.

80 85 90 95 Connecting passages 6 open into the milled channels 3 and are connected to an annular cooling-water chamber 7. The cooling-water chamber 7 is provided in a thickened portion of the wheel 1 and has at the top in its inner portion an annular opening 8 through which cooling water is continuously supplied through a supply pipe 9. Due to the very rapid rotation of the wheel, the water in the chamber 7 is forced by the centrifugal force into the outer por-

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- tion which is closed at the top and from there through the connecting passages 6 into the milled channels 3 located between the wheel segments 4, to reach the diamond segments 5. In this way, the diamond segments are constantly subjected to ample cooling and the water is forced against the surface of the workpiece adjacent the diamond segments and which is to be cut into. This surface is also cooled and the grinding sludge carried away. If too much water is conveyed outward through the connecting ducts 6, it is able to collect in the annular inner duct 2.
- Because of the effective cooling, it is possible, by means of the narrow, radially projecting diamond segments, to cut workpieces directly to the required thickness without the need for any subsequent finishing operation.
- Thus, the wheel according to the invention cuts through the workpiece in a single cut in contrast to the normal wheels. The wheel cuts horizontally as seen in Figures 1 and 2, and the surface of the workpiece which is left above the diamond segments 5 is broken away upwards by the wall 10 of the wheel which tapers conically towards the diamond segments. It is consequently possible to cut the workpiece directly to the required thickness and work the surface appropriately in one operation.
- In Figure 4, the diamond segments flare conically inwardly at 12 from the projecting front cutting surface 11, so that the surface 13 of the workpiece left above the segment is broken off by the harder segments. The diamond segments are harder than the steel of the wheel, so that damage to the wheel is thereby avoided.
- In the construction of Figure 5 a wheel according to Figures 1 to 3 is fitted with a second similar wheel 14 with diamond segments 15. This supplementary wheel 14 is useful when working stepped workpieces,

such as, for example, steps of a staircase, because it can cut a stepped surface immediately to the correct height.

If such wheels are employed in surface working machines in which the workpiece can be so fixed on the machine table by means of a three-point support that all the surfaces to be finished can be worked by corresponding wheels without changing the workpiece round or readjusting it, a very considerable saving in time is made owing to the fact that each wheel needs to be carried past the workpiece only once. When, furthermore, due to the good cooling action, the life of the diamond segments is considerably extended, such a surface-working machine brings a substantial saving in time and expense.

WHAT WE CLAIM IS:—

1. A cutting and finishing wheel for stone or artificial-stone workpieces divided at its periphery into segments which are separated by cooling-water channels supplied by internal passages and each of which is provided with a radially projecting diamond segment.
2. A wheel according to claim 1, and provided with an annular cooling-water chamber located inwardly from the diamond segments and which is connected to the cooling-water channels and has a water inlet.
3. A wheel according to claim 1 or claim 2 having a wedge-shaped periphery for lifting undercut parts of a workpiece.
4. A wheel according to claim 3 in which the wedge-shaped portion is defined by extensions of the diamond segments.

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Printed for Her Majesty's Stationery Office by Burgess & Son (Abingdon), Ltd.—1970.
 Published at The Patent Office, 25 Southampton Buildings, London, WC2A 1AY,
 from which copies may be obtained.

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